

REMARKS

The Final Office Action mailed February 17, 2009, has been received and reviewed. Claims 1 through 21, 32 through 42, 48 through 53, 60 through 63, and 65 through 67 are currently pending in the application. Claims 1 through 21, 32 through 42, 48 through 53, 60 through 63, and 65 through 67 stand rejected.

Claims 1 and 66, as proposed to be amended, recite that “at least one of A and B is a quaternized NR'R'R'”.” Claim 32 has been amended to recite that “at least one of A and B is NR'R'R'”” and “quaternizing at least one of A and B to form a conjugated cationic polymer.” Support for the amendments to claims 1, 32, and 66 is found in the as-filed specification at least at page 3, lines 9-12. Claims 2 through 21, 33, 34 through 36, 38, 48 through 53, 63, and 65 have been amended to improve antecedent basis. Claims 8, 32, 48, and 66 have been further amended to improve clarity and form. Claim 60 has been amended to independent form.

Applicant propose to amend claims 1 through 21, 32 through 36, 38, 48 through 53, 60, 63, 65, and 66, and respectfully request reconsideration of the application as proposed to be amended herein.

Claim Objections

Claims 1, 32, 66, and 67 are objected to as the presence of the parenthesis allegedly imply that “C3 to C10” is not a required element of the claim. The objection to claim 67 is moot, as this claim has been canceled without prejudice or disclaimer. The proposed amendments to claims 1, 32, and 66 should overcome the objections.

Claims 49 through 53 are objected to under 37 CFR §1.75(c) as being of improper dependent form for failing to further limit the subject matter of a previous claim. It is proposed that claim 1, from which claims 49 through 53 directly or indirectly depend, be amended to recite that “at least one of A and B is a quaternized NR'R'R'”.” Accordingly, claims 49 through 53, as proposed to be amended, properly depend from claim 1.

35 U.S.C. § 112 Claim Rejections

Claim 66 stands rejected under 35 U.S.C. § 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. It is asserted in the Office Action that the as-filed specification does not provide support for the chemical formula of claim 66. *Office Action of February 17, 2009*, p. 2. The proposed amendments to claim 66 should overcome this rejection.

Claims 48 through 53 and 60 through 63 stand rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. With respect to claims 48 through 53, it was asserted in the Office Action that there is insufficient antecedent basis for the limitation R''' in claim 48. *Office Action*, p. 2. It is proposed that claim 1 be amended to recite that "at least one of A and B is a quaternized NR'R''R''", to improve antecedent basis.

Regarding claims 60 through 63, it was asserted in the Office Action that claim 60 appears to provide a completely distinct method of making a conjugated cationic polymer in comparison to claim 32. *Office Action*, p. 3. Although Applicants do not agree with this statement, it is proposed that claim 60 be amended to independent form in an effort to advance the present application to issuance.

35 U.S.C. § 102(b) Anticipation Rejections

Anticipation Rejection Based on U.S. Patent Publication No. 2001/0053842 to Woo et al.

Claims 1, 2, 5, 11 through 15, and 21 stand rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent Publication No. 2001/0053842 to Woo et al. ("Woo"). Applicant respectfully traverses this rejection, as hereinafter set forth.

A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference. *Verdegaal Brothers v. Union Oil Co. of California*, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). The identical invention must be shown in as complete detail as is contained in the claim. *Richardson v. Suzuki Motor Co.*, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989).

Woo describes polymers formed from 2,7-substituted-9-substituted fluorenes. *Woo* at the Abstract. The fluorenes are substituted at the 9-position with two hydrocarbyl moieties and are substituted at the 2- and 7-positions with aryl moieties which may further be substituted with moieties which are capable of crosslinking or chain extension or a trialkylsiloxo moiety. *Id.* The 2,7'-aryl-9-substituted fluorene oligomers and polymers may be reacted with one another to form higher molecular weight polymers by causing the optional moieties on the terminal 2,7'-aryl moieties, which are capable of crosslinking or chain extension, to undergo chain extension or crosslinking. *Id.*

It is respectfully submitted that Woo does not anticipate independent claim 1, as proposed to be amended, because Woo does not expressly or inherently describe each and every element thereof. Specifically, Woo does not describe, either expressly or inherently, a conjugated cationic polymer having the formula of claim 1 wherein "at least one A and B is a quaternized NR'R''R'''" Rather, Woo describes a polymer prepared from a fluorene substituted at the 2- and 7-positions with aryl moieties. Woo does not describe, either expressly or inherently, a 2,7-substituted-9-substituted fluorene polymer that includes a quaternized (i.e., cationic) moiety.

Accordingly, it is respectfully submitted that claim 1, as proposed to be amended, recites subject matter which is allowable over that described in Woo.

Each of claims 2, 5, 11 through 15, and 21 is allowable, *inter alia*, as depending from an allowable base claim.

It is, therefore, respectfully requested that the 35 U.S.C. § 102(b) rejections of claims 1, 2, 5, 11 through 15, and 21 be withdrawn, and that each of these claims be allowed.

35 U.S.C. § 103(a) Obviousness Rejections

Obviousness Rejection Based on Non-Patent Literature Chem Commun, 2000, 551-552 to Liu et al. in View of Non-Patent Literature Acta Polymer, 45, 3-13, 1994 to Rau et al. and U.S. Patent Publication No. 2002/0013451 to Huang et al.

Claims 1, 3 through 5, and 7 through 21 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Liu et al., Chem. Commun, 2000, 551-552 (“Liu”) in view of Rau et al., Acta Polymer, 45, 3-13, 1994 (“Rau”) and U.S. Patent Publication No. 2002/0013451 Huang et al. (“Huang”). Applicant respectfully traverses this rejection, as hereinafter set forth.

To establish a *prima facie* case of obviousness the prior art reference (or references when combined) must teach or suggest all the claim limitations. *In re Royka*, 490 F.2d 981, 985 (CCPA 1974); *see also* MPEP § 2143.03. Additionally, the Examiner must determine whether there is “an apparent reason to combine the known elements in the fashion claimed by the patent at issue.” *KSR Int’l Co. v. Teleflex Inc.*, 127 S. Ct. 1727, 1740-1741, 167 L.Ed.2d 705, 75 USLW 4289, 82 U.S.P.Q.2d 1385 (2007). Further, rejections on obviousness grounds “cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.” *Id* at 1741, quoting *In re Kahn*, 441, F.3d 977, 988 (Fed. Cir. 2006). Finally, to establish a *prima facie* case of obviousness there must be a reasonable expectation of success. *In re Merck & Co., Inc.*, 800 F.2d 1091, 1097 (Fed. Cir. 1986). Furthermore, the reason that would have prompted the combination and the reasonable expectation of success must be found in the prior art, common knowledge, or the nature of the problem itself, and not based on the Applicant’s disclosure. *DyStar Textilfarben GmbH & Co. Deutschland KG v. C. H. Patrick Co.*, 464 F.3d 1356, 1367 (Fed. Cir. 2006); MPEP § 2144. Underlying the obvious determination is the fact that statutorily prohibited hindsight cannot be used. *KSR*, 127 S.Ct. at 1742; *DyStar*, 464 F.3d at 1367.

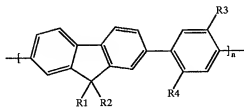
A *prima facie* case of obviousness under 35 U.S.C. § 103(a) cannot be established against claims 1, 3 through 5, and 7 through 21 because the applied references themselves or the inferences and creative steps that a person of ordinary skill in the art would have employed at the time of the invention would not have taught or suggested the claim limitations.

Liu teaches the cationic conjugated polymer poly[(9,9-dihexyl-2,7-fluorene)-*alt-co*-(2,5-bis{3-[*N,N*-dimethyl]-*N*-ethylammonium-1-oxapropyl}-1,4-phenylene)] dibromide. *See* Abstract. The cationic conjugated polymer is water-soluble and emits an intense blue fluorescence. *Id.* at page 552, column 2.

Rau teaches a Pd-catalyzed poly-condensation method for forming poly(*para*-phenylene) derivatives including 6-phenoxyhexyl side chains. *Id.* at page 8.

Huang teaches electroluminescent conjugated polymers including a backbone of alternated fluorene and phenylene units. *See* Abstract. The polymers of Huang are soluble in common organic solvents and emit blue light in film states. *Id.*

It is respectfully submitted that Liu, Rau and Huang, alone or in combination, do not teach or suggest all of the limitations of independent claim 1, as proposed to be amended, since Liu, Rau and Huang do not teach or suggest a conjugated cationic polymer having the formula of claim 1 wherein "at least one of A and B is a quaternized NR'R''." Although Liu teaches a cationic conjugated polymer (i.e., poly[(9,9-dihexyl-2,7-fluorene)-*alt-co*-(2,5-bis{3-[*N,N*-dimethyl]-*N*-ethylammonium-1-oxapropyl}-1,4-phenylene)] dibromide), Liu does not teach that fluorene may be substituted with a quaternized NR'R'' at the 2- or the 7-position. Instead, Liu teaches that the 2- and 7-position of the fluorene are substituted with an alkyl (i.e., C₆H₁₃). Rau does not teach a substituted fluorene and, thus, does not cure the deficiencies of Liu. Huang teaches a polymeric material comprising alternate substituted fluorene and phenylene units, represented by the formula:



wherein R₁ and R₂ are each selected from the group consisting of H, a (C₁-C₂₂) linear or branched alkyl, alkoxy or oligo (oxyethylene) group, a (C₆-C₃₀) cycloalkyl group, and an unsubstituted or substituted aryl group. Because Huang does not teach or suggest that at least

one of R₁ and R₂ is a quaternized (i.e., cationic) NR'R, Huang does not cure the deficiencies of Liu and Rau.

Since the applied references, alone or in combination, do not teach or suggest all of the limitations of claim 1, as proposed to be amended, it respectfully submitted that a *prima facie* case of obviousness cannot be established against any of claims 1, 3 through 5, and 7 through 21.

Obviousness Rejection Based on Liu in View of Rau and Huang and Further in View of PCT Publication No. WO99/54385 to Woo et al.

Claim 6 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Liu in view of Rau and Huang as applied to claim 1 and further in view of PCT Publication No. WO99/54385 to Woo et al. ("Woo"). Applicant respectfully traverses this rejection, as hereinafter set forth.

Claim 6 is allowable, *inter alia*, as depending from an allowable base claim.

Obviousness Rejection Based on Liu in View of Rau and Huang

Claims 32 through 39 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Liu in view of Rau and Huang. Applicant respectfully traverses this rejection, as hereinafter set forth.

A *prima facie* case of obviousness under 35 U.S.C. § 103(a) cannot be established against claims 32 through 39 because the applied references themselves or the inferences and creative steps that a person of ordinary skill in the art would have employed at the time of the invention would not have taught or suggested the claim limitations.

The teachings of Liu, Huang and Rau are as previously discussed.

It is respectfully submitted that Liu, Rau and Huang do not teach or suggest all of the limitations of independent claim 32, as proposed to be amended, since Liu, Rau and Huang do not teach or suggest a method that includes "quaternizing at least one of A and B to form a conjugated cationic polymer" wherein the conjugated cationic polymer has the formula of claim 32. As previously discussed, Liu teaches a cationic conjugated polymer (i.e., poly[(9,9-dihexyl-2,7-fluorene)-*alt-co*-(2,5-bis{3-[N, N-dimethyl]- N-ethylammonium-1-oxapropyl}-1,4-

phenylene)) dibromide), but does not teach quaternizing fluorene to form a conjugated cationic polymer. Neither Rau nor Huang teach or suggest quaternizing a moiety substituted on fluorene to form a cationic polymer and, thus, do not cure the deficiencies of Liu.

Accordingly, the applied references, alone or in combination, do not teach or suggest all of the limitations of claim 32, as proposed to be amended. It is, therefore, respectfully submitted that a *prima facie* case of obviousness cannot be established against any of claims 32 through 39.

Obviousness Rejection Based on Liu in View of Rau and Huang and Further in View of PCT Publication No. WO00/60612 to Ho et al.

Claims 40 through 42 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Liu in view of Rau and Huang as applied to claim 36 and further in view of PCT Publication No. WO00/60612 to Ho et al. ("Ho"). Applicant respectfully traverses this rejection, as hereinafter set forth.

Claims 40 through 42 are each allowable, *inter alia*, as depending from an allowable base claim.

Obviousness Rejection Based on Liu in View of Rau and Huang

Claims 47 through 53, 64, and 65 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Liu in view of Rau and Huang. The rejection of claims 47 and 64 is moot as each of these claims was previously canceled. Applicant respectfully traverses this rejection, as hereinafter set forth.

Each of claims 48 through 53, and 65 is allowable, *inter alia*, as depending from an allowable base claim.

Obviousness Rejection Based on Liu

Claims 60 through 63 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Liu. Applicant respectfully traverses this rejection, as hereinafter set forth.

Each of claims 60 through 63 is allowable, *inter alia*, as depending from an allowable base claim.

Obviousness Rejection Based on Liu in View of Rau and Huang

Claim 66 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Liu in view of Rau and Huang. Applicant respectfully traverses this rejection, as hereinafter set forth.

A *prima facie* case of obviousness under 35 U.S.C. § 103(a) cannot be established against claim 66 because the applied references themselves or the inferences and creative steps that a person of ordinary skill in the art would have employed at the time of the invention would not have taught or suggested the claim limitations.

The teachings of Liu, Huang and Rau are as previously discussed.

It is respectfully submitted that Liu, Rau and Huang do not teach or suggest all of the limitations of independent claim 66, as proposed to be amended. Specifically, Liu, Rau and Huang do not teach or suggest do not teach or suggest a conjugated cationic polymer having the formula of claim 66 wherein "at least one of A and B is a quaternized NR'R''R'''" for substantially the same reasons discussed with respect to claim 1.

Because Liu, Rau and Huang, alone or in combination, do not teach or suggest all of the limitations of claim 66, a *prima facie* case of obviousness cannot be established against claim 66.

Obviousness Rejection Based on Liu in View of Rau and Huang

Claim 67 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Liu in view of Rau and Huang. The rejection of claim 67 is moot, as this claim has been canceled.

Thus, it is respectfully requested that the 35 U.S.C. § 103(a) rejections of claims 1, 3 through 21, 32 through 42, 47 through 53, and 60 through 66 be withdrawn, and that each of these claims be allowed.

Double Patenting

The Examiner has advised Applicant that should claim 1 be found allowable, claim 67 would be objected to under 37 CFR §1.75 as being a substantial duplicate thereof.

Claim 67 has been canceled herein, rendering the objection thereto moot.

CONCLUSION

Claims 1 through 21, 32 through 42, 48 through 53, 60 through 63, 65, and 66 are believed to be in condition for allowance, and an early notice thereof is respectfully solicited. Should the Examiner determine that additional issues remain which might be resolved by a telephone conference, he is respectfully invited to contact Applicants' undersigned attorney.

Respectfully submitted,



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